We claim:

1. A system for pumping slurry from a slurry source to a slurry output, said system comprising:

a peristaltic pump having an inlet and an outlet;

a slurry supply line communicating with the inlet of the pump;

a slurry output line in fluid communication with the outlet of the pump, wherein said output line provides slurry to the slurry output;

a pressure sensor, operably connected to the slurry supply line, for sensing the pressure in the supply line; and

a controller operatively connected to the pump and the pressure sensor, said controller being programmed to receive input regarding the pressure sensed by the pressure sensor, to accept input regarding the desired flow rate, and to calculate the pump speed required to provide the desired flow rate based on the pressure in the supply line, and maintain the pump speed at the calculated pump speed.

2. The device of claim 1 wherein the pressure sensor is a non-intrusive pressure sensor which senses pressure in the slurry supply line without placing any structure in the slurry flow.

3. The device of claim 1 wherein the controller is programmed to calculate the pump speed required to provide the desired output based on the equation $RPM = M \times \text{Flow rate}$, where RPM is the pump speed, M is the pump speed proportionality constant.

4. The device of claim 3 wherein the pump speed proportionality constant M is calculated based on the equation $M = slope(\text{inlet pressure}) + c$, where the value of the slope and c in the equation are empirically determined through testing of the system.

5. A method for pumping slurry comprising:

pumping the slurry from a slurry source through a supply line to a slurry output using a peristaltic pump;

sensing the pressure in the supply line;

determining a desired flow rate of slurry;

calculating a pump speed required to provide the desired flow rate based on the pressure in the supply line; and

operating the pump at the calculated pump speed.

6. The method of claim 5 wherein the calculating step calculates the pump speed required to provide the desired flow rate based on the equation $RPM = M \times \text{Flow rate}$, where RPM is the pump speed, M is the pump speed proportionality constant.

7. The method of claim 6 wherein the pump speed proportionality constant M is calculated based on the equation $M = slope(\text{inlet pressure}) + c$, where the value of the slope and c in the equation are empirically determined through testing of the system.

8. A method for pumping slurry comprising:

pumping the slurry from a slurry source through a supply line to a slurry output using a peristaltic pump;

sensing the pressure in the supply line;

determining a desired flow rate of slurry;

calculating a pump speed required to provide the desired flow rate based on the pressure in the supply line; and

operating the pump at the calculated pump speed.

9. The method of claim 8 wherein the calculating step calculates the pump speed required to provide the desired flow rate based on the equation $RPM = M \times \text{Flow rate}$, where RPM is the pump speed, M is the pump speed proportionality constant.

10. The method of claim 9 wherein the pump speed proportionality constant M is calculated based on the equation $M = slope(\text{inlet pressure}) + c$, where the value of the slope and c in the equation are empirically determined through testing of the system.